

Problem O.3. Calculate all relevant thermodynamic characteristics of an ideal 1D electron gas. Why is this model not very realistic?

Problem O.4. Starting from the material of Sec. 3.5 of the lecture notes, calculate all remaining thermodynamic characteristics of a Bose gas below T_c . Check whether your results satisfy all the thermodynamic relations discussed in Ch. 1.

Problem O.5. Extend the assignment of Homework 7 to the calculation of energy jumps in a van der Waals gas at the 1st order transitions between the gaseous and liquid phases, at fixed pressure, assuming that the transitions are delayed to the points where the initial phase disappears (dashed arrows in Fig. below). Compare the results with the latent heat of the same gas at the reversible transition between the phases (bold line in the Fig.).

